CLAIMS

1. A water absorbent comprising water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin having a cross-linked structure prepared by polymerizing a monomer including at least acrylic acid and/or its salt, the water absorbent satisfying:

(a) 90% by weight or more of the particles have a diameter less than 850μm but not less than 150μm;

(b) a logarithmic standard deviation (σ ζ) of the particle size distribution is in a range of 0.25 to 0.45;

(c) AAPs for 0.9wt% saline is 20g/g or more;

(d) CRCs for 0.9wt% saline is not less than 29g/g but less than 39g/g;

(e) a chemical cross-linking index is 160 or more, the chemical cross-linking index represented by Formula (1):

Chemical Cross-Linking Index

$$= (CRCs)/(CRCdw) \times 1000 \cdots (1),$$

where CRCs(g/g) is an absorbency for 0.9wt% saline, and CRCdw(g/g) is an absorbency for deionized water.

2. The water-absorbent as set forth in Claim 1 wherein the chemical cross-linking index is 170 or more.

3. A water absorbent comprising water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin having a cross-linked structure prepared by polymerizing a monomer including at least acrylic acid and/or its salt, the water absorbent satisfying:

(a) 90% by weight or more of the particles have a diameter less than 850μm but not less than 150μm;

(b) a logarithmic standard deviation ($\sigma\zeta$) of the particle size distribution is in a range of 0.25 to 0.45;

(c) AAPs for 0.9wt% saline is 20g/g or more;

(f) CRCs for 0.9wt% saline is not less than 15g/g but less than 29g/g;

(g) a chemical cross-linking index against pressure is 100 or more, the chemical cross-linking index against pressure represented by Formula (2):

$$\text{Chemical Cross-Linking Index Against Pressure} = (\text{CRCs}) + (\text{AAPdw}) \cdots (2),$$

where CRCs(g/g) is an absorbency for 0.9wt% saline, and AAPdw (g/g) is an absorbency against pressure for deionized water.

4. The water absorbent as set forth in Claim 3,

wherein the chemical cross-linking index against pressure is 115 or more.

5. The water absorbent as set forth in any one of Claims 1 to 4, containing a phosphorus atom.

6. The water absorbent as set forth in any one of Claims 1 to 5, wherein the water absorbent has Saline Flow Conductivity (SFC) in a range of 30 to 3000 ($10^{-7} \cdot cm^3 \cdot s \cdot g^{-1}$) or more.

7. The water absorbent as set forth in any one of Claims 1 to 6, wherein the water absorbent has Saline Flow Conductivity (SFC) in a range of 100 to 250 ($10^{-7} \cdot cm^3 \cdot s \cdot g^{-1}$) or more.

8. The water absorbent as set forth in any one of Claims 1 to 7, comprising a liquid permeability improver (F).

9. The water absorbent as set forth in Claim 8, wherein the liquid permeability improver (F) is a multivalent metal compound.

10. A method of producing a water absorbent

containing water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin prepared by cross-linking polymerization of a monomer including acrylic acid and/or its salt, wherein:

the water absorbing resin has Swelling Pressure of Gel Layer (SPGL (B)) of 35.0 (kdyne/cm^2) or more;

the particles has such a particle size distribution that 95% to 100% by weight of the particles have a diameter less than 850μm but not less than 106μm, the particle size distribution measured by JIS standard sieve; and

a logarithmic standard deviation (σ ζ) of the particle size distribution is in a range of 0.25 to 0.45..

11. A method of producing a water absorbent containing water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin prepared by cross-linking polymerization of a monomer including acrylic acid and/or its salt, wherein:

the cross-linking polymerization is a boiling polymerization that is carried out in the presence of a water-soluble chain transfer agent of 0.001mol% to 10mol% with respect to the monomer to be polymerized by the boiling polymerization.

12. The method as set froth in Claim 10 or 11, wherein:

the water-absorbing resin has CRCs in a range of 28 to 40 (g/g), and Swelling Pressure of Gel Layer (SPGL (B)) of 40.0 (kdyne/cm^2) or more.

13. The method as set forth in any one of Claims 10 to 12, wherein:

the water-absorbing resin is surface cross-linked until the water-absorbing resin has Saline Flow Conductivity (SFC) of 40 (10^{-7} cm^{3}s g^{-1}) or more, and then adding a liquid permeability improver to the water-absorbing resin.

14. The method as set forth in any one of Claims 11 to 13, wherein:

the particles has such a particle size distribution that 95% to 100% by weight of the particles have a diameter less than 850μm but not less than 106μm, the particle size distribution measured by JIS standard sieve; and

a logarithmic standard deviation ($\sigma\zeta$) of the particle size distribution is in a range of 0.25 to 0.45.

15. The method as set forth in any one of Claims 10,

12 and 14, wherein:

the monomer contains a water-soluble chain transfer agent by 0.001mol% to 10mol% with respect to the monomer to be polymerized.

16. The method as set forth in any one of Claims 10 to 15, comprising:

further adding a liquid permeability improver of 0.001 parts to 5 parts by weight with respect to 100 parts by weight of the particles.

17. The method as set forth in any one of Claims 10 to 16, wherein:

every one percent by weight of the liquid permeability improver to the surface cross-linked water-absorbing resin particles, increases Saline Flow Conductivity (SFC) at a rate of 3.5 times or more.

18. The method as set forth in any one of Claims 13, 16, and 17, wherein:

the liquid permeability improver contains at least one of an inorganic powder or a multivalent metal compound.

19. A water absorbent prepared by the method as set forth in Claims 10 to 18, comprising:

surface cross-linked water-absorbing resin particles a chemical cross-linking index against pressure of the water absorbent being 100 or more, the chemical cross-linking index against pressure represented by Formula (2):

$$\text{Chemical Cross-Linking Index Against Pressure} = (\text{CRCs}) + (\text{AAPdw}) \cdots (2),$$

where CRCs(g/g) is an absorbency for 0.9wt% saline, and AAPdw (g/g) is an absorbency against pressure for deionized water.